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DESCRIPTION OF INVENTION
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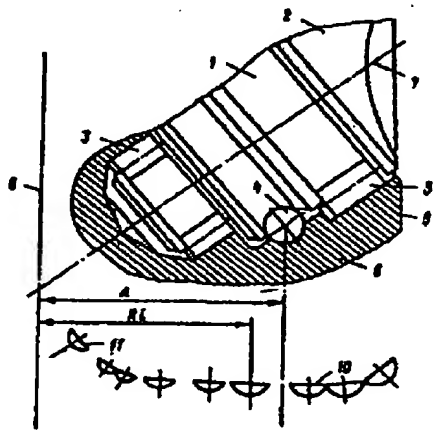
(71) I. M. Gubkin Moscow Oil & Gas Institute and the Special Drill Bit Design Institute of the "Kuibyshev-burmash" Production Association.
(72) A. F. Bragin, V. A. Bondarchuk, V. A. Pyalchenkov, Yu. I. Basanov, and G. V. Zhukov
(53) 622.24.051.557 (088.8)
(56) I. K. Maslennikov et al. Tool for Drilling Wells. Moscow: Nedra Publishers, 1984, p. 27.
Roller Bits and Drilling Heads. Moscow: TsINTIkhimneftemash Publishers, 1982, p. 33.

(54) ROLLER DRILL BIT

(57) The invention is a rock-breaking drilling tool and it makes it possible to increase the service life of a drill bit through a more equal distribution of the load on the bearings and the cutter rows. The bit contains legs 2 with journals 1, and multi-row cutters 6, which are held on journals 1 by means of retaining ball bearing 4. The latter is located between peripheral and terminal block bearings 3. All rows are located on cutters 6 per the ratio $(A-Ri) \geq d/2$, where A is the maximum distance from the bit axis to the center of the ball of retaining ball bearing 4; Ri is the maximum distance from the axis of the bit to the intersection point of the row's axis of symmetry and the generating line of cutter 6; d is the diameter of the ball of retaining ball bearing 4. When this condition is met, the inequality of the axial load distribution is reduced on the individual bearings and cutter rows. 1 illustration.

Fig. 1



The invention relates to a rock-breaking tool, specifically to roller drill bits.

The goal of the invention is to increase the service life of a drill bit through a more equal distribution of the load on the bearings and the cutter rows.

The drawing shows a diagram of the bottomhole coverage by the roller bit, combined with a diagram of the bearing unit.

The roller bit consists of journals 1, legs 2, and cutters 6 mounted on journals on bearings 3, 5, and 5 (only one bearing unit is shown on the drawing). Axis 7 is the axis of journal 1 and cutter 6. Axis 8 is the axis of the drill bit. Surface 9 of cutter 6 is a calibrating surface and it determines the diameter of the drill bit and of the well being drilled. A is the distance from axis 8 of the drill bit to the center of the lower ball (the one farthest from the drill bit axis), with diameter d, of retaining ball bearing 4. Diagram 10 is a diagram of the bottomhole coverage. 11 is the teeth of the cutter rows; Ri is the maximum distance from the drill bit axis to the intersection point of the row's (tooth's) axis of symmetry and the generating line of the cutter.

If the value of Ri meets the condition

$$|A - R_i| \geq \frac{d}{2},$$

then the inequality of the axial load distribution is reduced on the individual bearings and cutter rows. In this case the service life and durability of the cutting structure of the cutters and bearings is equalized, which increases the service efficiency of the roller drill bit.

CLAIM

The roller drill bit, containing legs with journals and multi-row cutters held on the journals by means of a retaining ball bearing located between the peripheral and terminal block bearings, is distinctive in that, by increasing the drill bit service life through a more equal distribution of the load on the individual bearings and cutter rows, all rows are located on the cutters per the ratio

$$|A - R_i| \geq \frac{d}{2},$$

where A - the maximum distance from the drill bit axis to the center of the ball of the retaining ball bearing, mm;

Ri - the maximum distance from the drill bit axis to the intersection point of the row's axis of symmetry and the generating line of the cutter, mm;

d – diameter of the ball of the retaining ball bearing, mm.

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